

REMARKS

(1) Claims 1-10 and 21-32 are currently pending in the present application. Applicant respectfully requests reconsideration of claims 1-10 and 21-32.

(2) Applicant submits that claims 1-10 and 21-32 are clearly in condition for allowance, as will be discussed herein below. Applicant presents the remarks below in an effort to further point out the distinctions to the Examiner at this time, in hopes of avoiding an unnecessary appeal process for this case. The accompanying remarks are necessary in light of the position taken in the Final Office Action. The remarks of the instant response further clarify and distinguish Applicant's invention over Examiner's grounds of rejection and supporting reasoning presented in the Final Office Action.

(3) The Final Office Action cited the following references:

A. U. S. Patent 5,930,670, by Park, entitled *Method Of Forming A Tungsten Plug Of A Semiconductor Device* (referred to as "Park" hereinafter);

B. U. S. Patent 6,610,597 B2, by Kobayashi, entitled *Method Of Fabricating A Semiconductor Device* (referred to as "Kobayashi" hereinafter);

C. U. S. Published Patent Application 2003/0091870, by Bhowmik, *et al.*, entitled *Method Of Forming A Liner For Tungsten Plugs*, (referred to as "Bhowmik" hereinafter; and

D. U. S. Patent 6,268,090, by Matsubara, *et al.*, entitled *Process For Manufacturing Semiconductor Device And Exposure Mask* (referred to as "Matsubara" hereinafter).

(4) Claims 1-3, 5, 6, 21, 22, 25-28, 31, and 32 have been rejected under 35 U.S.C. § 102(b) as assertedly being anticipated by Park. Applicant respectfully traverses these rejections for the following reasons.

Claims 1-10

In the Response to Arguments section of the Final Office Action, the Office Action stated that "Park does disclose a method . . . where the method includes polishing the metal layer (26) to remove a top portion of the metal layer (26)." Final Office Action, p. 8. A careful reading of Park will reveal that there is no mention, disclosure, or teaching of a *polishing* step. Park only discloses *etching* the tungsten layer. Etching is not polishing. Park cannot teach polishing because the focus of Park is eliminating a residual buildup of tungsten left on a non-flat, uneven, and/or sloped surface after *etching* the tungsten. All embodiments shown and discussed in Park deal with this problem. Furthermore, all of the claims in Park require an etching step. Thus, clearly Park is focused on a different method using *etching* to address a problem caused by the *etching*.

"A claim is anticipated only if *each and every element* as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." MPEP 2131 (8th ed., rev. 2, May 2004) (emphasis added). The method of claim 1 requires, among other things, a step of "*polishing* said tungsten layer to remove a top portion of said tungsten layer." (emphasis added). This step is an element that cannot be ignored or passed over. If the rejection of independent claim 1 should be maintained, it is respectfully requested that the Patent Office point out with particularity how and where Park discloses this *polishing* step. Unless a persuasive showing can be made that properly supports the alleged anticipation of claim 1, the rejection thereof should be withdrawn and claim 1 should be allowed.

Because claims 2-10 depend from claim 1, Applicant respectfully submits that claims 2-10 are patentable over Park at least because of their dependency from independent claim 1 for the reasons discussed above. Thus, Applicant respectfully asserts that claims 1-10 are patentable over Park.

Claims 21-26

Although the scope of claim 21 differs from that of claim 1, Applicant submits arguments for claim 21 similar to those of claim 1. Such arguments are laid out in detail here for claim 21 due to the differing prosecution histories and scopes of claims 1 and 21. Claim 21 was newly added in the prior amendment and response.

A careful reading of Park will reveal that there is no mention, disclosure, or teaching of a *polishing* step. Park only discloses *etching* a tungsten layer. Etching is not polishing. The method of claim 21 requires, among other things, a step of "*polishing* said metal layer to remove a top portion of said metal layer." (emphasis added). This step is an element that cannot be ignored or passed over. If the rejection of independent claim 21 should be maintained, it is respectfully requested that the Patent Office point out with particularity how and where Park discloses this *polishing* step. Unless a persuasive showing can be made that properly supports the alleged anticipation of claim 21, the rejection thereof should be withdrawn and claim 21 should be allowed.

Because claims 22-26 depend from claim 21, Applicant respectfully submits that claims 22-26 are patentable over Park at least because of their dependency from independent claim 21 for the reasons discussed above. Thus, Applicant respectfully asserts that claims 21-26 are patentable over Park.

Claims 27-32

Although the scope of claim 27 differs from that of claims 1 and 21, Applicant submits arguments for claim 27 similar to those of claims 1 and 21. Such arguments are laid out in detail here for claim 27 due to the differing prosecution histories and/or scopes of claims 1, 21, and 27. Claim 27 was newly added in the prior amendment and response.

A careful reading of Park will reveal that there is no mention, disclosure, or teaching of a *polishing* step. Park only discloses *etching* a tungsten layer. Etching is not polishing. The method of claim 27 requires, among other things, a step of "*polishing* said metal layer to remove a top portion of said metal layer." (emphasis added). This step is an element that cannot be

ignored or passed over. If the rejection of independent claim 27 should be maintained, it is respectfully requested that the Patent Office point out with particularity how and where Park discloses this *polishing* step. Unless a persuasive showing can be made that properly supports the alleged anticipation of claim 27, the rejection thereof should be withdrawn and claim 27 should be allowed.

Because claims 28-32 depend from claim 27, Applicant respectfully submits that claims 28-32 are patentable over Park at least because of their dependency from independent claim 27 for the reasons discussed above. Thus, Applicant respectfully asserts that claims 27-32 are patentable over Park.

(5) Claims 4, 7-9, 23, and 29 were rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over Park in view of Kobayashi. Claim 10 was rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over Park in view of Bhowmik. Claims 24 and 30 were rejected under 35 U.S.C. § 103(a) as assertedly being unpatentable over Park in view of Matsubara.

Applicant respectfully traverses these rejections for the following reasons. Regarding obviousness, MPEP 2143 (8th ed., rev. 2, May 2004) states:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations.

Claims 4, 7-10, 24, 29, and 30

The rejections of dependent claims 4, 7-10, 24, 29, and 30 are all in view of Park combined with other references. As discussed above regarding the independent claims, respectively, Park does not disclose, teach, or suggest a *polishing* step. *Etching* is not *polishing*.

Regarding the other references cited (Kobayashi, Bhowmik, and Matsubara), none of these references teach, disclose, or suggest the polishing steps required by the independent claims.

Kobayashi only discloses *etching* a tungsten layer. Kobayashi teaches and discusses a problem of *overetching* the tungsten layer. All embodiments shown and discussed in Kobayashi deal with this problem. Furthermore, all of the claims in Kobayashi require an etching step. Thus, clearly Kobayashi is focused on a different method using *etching* to address a problem caused by the *etching*.

A careful reading of Bhowmik will reveal that there is no mention, disclosure, or teaching of a *polishing* step for a tungsten or metal plug, as the claims require. Bhowmik is focused on the formation of a liner for a tungsten plug.


A careful reading of Matsubara will reveal that Matsubara is focused on the formation of an exposure mark. There is no mention, disclosure, or teaching of a *polishing* step for a tungsten or metal plug in Matsubara, as the claims require.

If the rejection of claims 4, 7-10, 24, 29, and 30 should be maintained, it is respectfully requested that the Patent Office point out with particularity how and where Park or the other references cited, either singularly or combined, discloses all of the required limitations of claims 4, 7-10, 24, 29, and 30. Applicant respectfully requests that the Patent Office point out with specificity how *all the claim limitations* of claims 4, 7-10, 24, 29, and 30 are found in the prior art of record and how any such purported combination of the prior art can be combined in a way taught by the references themselves and not based on Applicant's own patent disclosure. In the absence of a *prima facie* showing of obviousness by the Patent Office, Applicant submits that claims 4, 7-10, 24, 29, and 30 should now be allowed.

(6) In view of the above, Applicant respectfully submits that this response complies with 37 CFR § 1.116. Applicant further submits that the claims are in condition for allowance. No new matter has been added by this amendment. If the Examiner should have any questions, please contact Applicant's attorney at the number listed below. No fee is believed due in connection with this filing. However, in the event that there are any fees due, please charge the same, or credit any overpayment, to Deposit Account No. 50-1065.

Respectfully submitted,

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Date


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